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A PRACTISING VETERINARY SURGEON'S REVIEW OF LUTEINISING HORMONE*

BY

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I have chosen this subject because I am interested in it, and also because I felt that at the present stage in our knowledge a general discussion might be beneficial. Work on the actions of hormones is still very much in the field of experimental science, but the practising veterinary surgeon—if he or she keeps a critical outlook—may provide useful information as to the practical application of these hormones. Oestrodiol (or oestrogen) was first isolated in 1935 and a few years later stilboestrol, the synthetic oestrogen, was discovered. This hormone was the first sex hormone to be used extensively in veterinary practice—largely owing to its comparative cheapness, and for a short time it was used in and out of season, on large animals and small, male and female. While not recommending such unscientific behaviour, I feel those veterinary surgeons who hail every new drug with enthusiasm serve a useful purpose in that the toxicity of the new substance is thoroughly tested out in the field.

To return to the subject of the paper, during the last few years considerable strides have been made in our knowledge of the hormones, and now it is generally agreed that the anterior pituitary gland produces follicle stimulating hormone which stimulates the formation and growth of the Graafian follicles in the ovary, these Graafian follicles, in turn, produce oestrogen which inhibits the secretion of follicle stimulating hormone and luteinising hormone is produced instead. Luteinising hormone, in conjunction with oestrogen, causes rupture of the mature Graafian follicle or follicles and subsequently stimulates the formation of a corpus luteum. The corpus luteum produces progesterone. That is the basic story, but there are variations in each species as well as among the individual animals of a given species, and at the present time there is no way of estimating the amount of any given hormone which is required to keep the balance at any given moment in the cycle. The most striking variations of practical importance are found in the mare, the bitch and the cat. In the mare the normal duration of oestrus varies greatly, and when it is considered that ovulation takes place 24 to 48 hours before the end of oestrus, and for maximum conception rates service should take place within the 72 hours immediately prior to ovulation, it is obvious that unless repeated service is possible there is a considerable risk of an infertile mating. In the bitch oestrus is prolonged, but duration is fairly constant, and it is followed by a long luteal phase, and then a long period of anoestrus. In the cat and the rabbit duration of oestrus may be nearly as long as in the bitch, but ovulation occurs only when the cervix is stimulated by service. The signs of heat or oestrus are produced by the secretion of oestrogen by the ovary, so that heat is not an indication of ovulation, only of growing and actively secreting Graafian follicles. Ovulation in the mare and cow is usually presumed to have taken place if a mature corpus luteum can be palpated between the 8th and 14th day after oestrus. In the small animals where rectal examination of the ovaries is not possible there is no satisfactory method of assessing the presence of a corpus luteum in the ovary. Work on cells present in smears taken from the vaginal wall at various stages of the cycle is being carried out, and one day this may give us the necessary information.

All the accessory sex organs are under the control of the hormones described above, but the most important actions from a practical point of view are on the udder and uterus. The control of the mammary gland is complex and both oestrogen and luteinising hormone are necessary for the growth and development of the glands in all species except the cow and the goat—in these animals oestrogen alone can cause the glands to develop and actually secrete milk, although both hormones play their part in the normal development of the glands. The actions on the uterus and vagina appear to be simpler ; oestrogen prepares the uterus and vagina for service by causing hyperaemia and proliferative changes in the endometrium, stimulating the formation of lubricating discharges, increasing the sensitivity and motility of the uterus and dilating the cervix, whilst progesterone inhibits the oestrogenic action on the uterus so that the uterus becomes flaccid, muscularly atonic and not susceptible to stimulation by the oxytocic factor of the post-pituitary gland, and it prepares the endometrium for implantation of the fertilised ovum.

Luteinising hormone used in veterinary practice is obtained from human pregnancy urine ; it can be given hypodermically by either the intravenous or the intramuscular route, but given by the mouth it is destroyed by the digestive juices. The luteinising hormone combines with oestrogen to produce ovulation, and then stimulates the formation of a healthy corpus luteum ; consequently, it ensures that sufficient progesterone is secreted to maintain pregnancy. I feel, therefore, that it is not out of place in a paper on luteinising hormone to say a few words about progesterone. This substance can be made synthetically from the soya bean, which fact, of course, enhances its value from an economic point of view. It may be used wherever the product of the corpus luteum is required rather than the direct action of the luteinising hormone, and is usually administered by oily intramuscular injection or by implantation.

USES OF LUTEINISING HORMONE

In the Mare.—The most obvious use for luteinising hormone in the mare is to produce ovulation on a known day, and so save repeated services or the disappointment of an infertile service if only one or at the most two services are possible. It is advisable to give 1,000 to 2,000 I.U. on the day of service—whether before or after actual mating has taken place is immaterial as rupture of the ovum will occur within 24 to 48 hours of injection, if a suitably mature follicle is present in the ovary. Cystic ovaries may also be treated with luteinising hormone, using one injection of 1,000 to 2,000 I.U. intravenously or 500 I.U. subcutaneously daily for four to five days.

In the Cow.—In cows where ovulation is delayed more

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than the usual 12 to 16 hours after the termination of oestrus, the injection of luteinising hormone during oestrus will hasten maturation and ovulation. In other cows it may be necessary to give luteinising hormone to rupture the Graafian follicle, but it is extremely difficult to be certain that ovulation is not taking place unless very frequent rectal examinations are made and in isolated cases this is hardly an economic proposition. In cases where no corpus luteum can be palpated at the 10th day it is presumed that ovulation has not taken place, but it is possible that enough luteinising hormone was present to cause ovulation, and not enough to form a corpus luteum. Frequently cows will form a corpus luteum and the fertilised ovum will become imbedded in the wall of the uterus, and yet subsequently foetal absorption will take place if there is a deficiency of progesterone, and until about the 12th week the only source of progesterone is the corpus luteum. This can be overcome by injections of 1,000 I.U. luteinising hormone at two and a half, five and a half, and eight and a half weeks or by the implantation of a progesterone tablet a few days after service. When a cow returns to service at irregular intervals a rectal examination of the ovaries should be made at the 10th day after the termination of oestrus, and if a small or a cystic corpus luteum is found, treatment with luteinising hormone should be given. In these cases an initial dose on the day of service will probably establish a healthy corpus luteum, but it is usually wiser to follow on with further injections or with an implant of progesterone. Both luteinising hormone injections and progesterone implants have been used in cases of cystic ovaries and some success claimed. The luteinising hormone may cause rupture of the cysts and subsequent corpus luteum formation, but some workers recommend manual rupture of the cysts at the time of the luteinising hormone injection. Where the cysts cannot be ruptured manually and do not respond to luteinising hormone it is as well to try progesterone as this substance has a sensitising effect on the ovary and will often succeed where luteinising hormone has failed.

In the Sow.—Luteinising hormone in doses of 500 I.U. intramuscularly on the day of service has been found most useful in the sow that appears normal and yet fails to hold to the boar. It has also been used in conjunction with stilboestrol in those sows that fail to show any external signs of oestrus, stilboestrol being given first, followed by luteinising hormone as soon as oestrus occurs, to ensure rupture of the Graafian follicle and healthy implantation of the ova.

In the Goat.—I have used 100 I.U. on the day of service with apparent success on goats that failed to hold to repeated services, and also in one case to prevent abortion at mid-pregnancy.

In the Ewe.—The use of hormones in the ewe is not an economic procedure, and according to present records deficiency of luteinising hormone or its products does not appear to be an important factor in sheep breeding.

In the Bitch.—In the small-animal field most of the work has been done on bitches. Owing to the difficulty of palpating the canine ovary the diagnosis of luteal deficiency cannot easily be confirmed, but in many cases where bitches are erratic in their return to oestrus, and do not become pregnant after service, it is probable that insufficiency of luteinising hormone is the cause, and several such cases have been reported as responding to treatment. I know of only one such case myself, but it was an apparently infertile Spaniel bitch which came on heat for a variable time every three months. Following 100 I.U. luteinising hormone by intramuscular injection at the time of service, this bitch became pregnant, and delivered a litter of live healthy pups at full term. Then there are the bitches that for no apparent reason abort between the fifth and seventh week of pregnancy—these, I feel, could be successfully treated with luteinising hormone—or in bitches that make a regular practice of abortion, possibly a progesterone implant would be more rational. Another use of luteinising hormone is in the treatment of pyometra. This is a condition which is a nuisance and sometimes a tragedy to the private owner and an economic loss to the breeder. The bitch is unusual in that the luteal phase is continued for a time equivalent to the full period of gestation whether the animal is pregnant or not, and it is during this phase that a sterile pyometra develops; therefore it appears rational to assume that deficiency of progesterone, which should be the controlling hormone at this time, excess of oestrogen, or both, is the cause of pyometra in the majority of cases. This is confirmed by the frequency with which ovarian cysts are found when operating on such cases. Some four or five years ago I started using chorionic gonadotropin (luteinising hormone and traces of oestrogen). Later I changed to luteinising hormone which is a purified form of chorionic gonadotropin, and during the last few months I have tried progesterone implants*: with all these substances I have had considerable success in a large proportion of cases. The first case was a grossly fat Golden Spaniel, 12 years old, and apparently moribund, which had begun discharging that morning; the owner wept copiously and begged me not to put the animal down. After 20 minutes I was persuaded and gave Prolan intramuscularly. I returned next day determined not to be over-persuaded again, and was met at the door by my patient! She relapsed biannually for three or four years, but after the first occasion the owner recognised the early symptoms, and one injection sufficed. Pyometra cases should be given 50 to 150 I.U. luteinising hormone intramuscularly and seen again in 24 to 48 hours, giving at the same time routine medical treatment to improve the animal's condition. Further injections of 50 to 150 I.U. luteinising hormone should be given at two- to four-day intervals until the discharge is clear and mucoid in character, and greatly reduced in quantity. If there is little or no response to either the first or second injection it is usually advisable to admit failure and recommend surgical interference. The progesterone implants should be employed where there is definite response to the first injection of luteinising hormone. The most satisfactory site for implantation appears to be the muscle of the neck and in the average bitch the procedure can be carried out very satisfactorily under local anaesthesia. There is no need to remove the implant as absorption of the entire tablet takes place in five to six weeks. The use of progesterone has several advantages over luteinising hormone—absorption is steady, the ovary is sensitised and resistant cysts may disappear, and the animal is not subjected to a series of intramuscular injections which frequently cause the patient pain, the owner distress, and the veterinary surgeon annoyance. Following on a suggestion from a colleague, I have tried "male hormonigen tablets" by the mouth on a number of cases with surprising success; whether it is due to a combination of the endocrine substances contained in these tablets or whether it is the thyroid alone which acts on the anterior pituitary, and so restores the cycle to normal, I do not know. I would like to add here that French workers also report the successful use of luteinising hormone in the treatment of pyometra in the bitch.

I have attempted treatment of those bitches that suffer from patches of baldness during the luteal phase, but so far I have had no response. Possibly this condition is closely associated with the formation of milk, and the peculiar

* Kindly supplied by Burroughs Wellcome & Co.

mental changes associated with pseudo-pregnancy in the bitch. I remember that treatment with stilboestrol was frequently effective in such cases—the drawback being that the bitch usually came "on heat" again, and as a result the treatment was dropped. Many veterinary surgeons have recommended the use of luteinising hormone to suppress oestrus and some have reported the occurrence of pyometra at the following oestrus. Presumably, luteinising hormone was given early in the cycle, and so inhibited the formation of the Graafian follicles, and upset the rhythm of the cycle. It would be interesting to know whether a stimulated heat at a later date, but prior to the next oestrus period, would correct the condition. For those bitches that continue to show blood-stained discharge after 21 days from the onset of oestrus the intramuscular injection of 50 to 150 I.U. of luteinising hormone is most effective. Presumably, the condition is caused by a deficient corpus luteum.

In the Cat.—The average cat owner is only too glad if his or her queen is infertile, and the breeding fraternity are in such a minority that there has been little opportunity for field work with luteinising hormone in this species. The only indication for luteinising hormone in the cat appears to be in cases of infertility associated with irregular return to service, of habitual abortion, and of cystic ovaries. These latter cases must not be confused with the cat that continues "on heat" until she is mated as this is a normal occurrence, and not associated with any pathological condition of the sexual organs.

In the Hen.—I can see no practical application in this field at the present time, but it is of interest to note that, experimentally, both progesterone and luteinising hormone will accelerate ovulation in a hen which has a ripe Graafian follicle in the ovary—also that the luteinising hormone may be of mammalian or avian origin, but must be given intravenously—the progesterone is effective either intravenously or subcutaneously.

In the Male.—A few words may be said here about the use of luteinising hormone in the male—progesterone is very similar to testosterone and the injection of luteinising hormone into a male stud animal that has been showing loss of sexual interest does appear to have a beneficial effect. Four injections at weekly intervals are also recommended in the treatment of cryptorchidism. In the dog 100 to 250 I.U. is suggested as a treatment for those animals that appear attractive to other dogs.

Toxicity and Contra-indications

Toxicity is non-existent if the hormone is used in the recommended doses—and at the present price the cost of excessive overdosing is prohibitive. The main drawback is that many animals appear to be allergic to luteinising hormone given intravenously, and though it seldom proves fatal it is very alarming. Given intramuscularly, there is little or no risk of an allergic reaction, but larger doses are probably necessary to produce the best results. Luteinising hormone is, of course, contra-indicated where it is unnecessary as it is bound to upset the balance of the sexual cycle, and in the present state of our knowledge it is impossible to estimate how much or how little harm may be done. All we can say at the moment is that, clinically, luteinising hormone has beneficial effects and few, if any, ill effects.

Before closing, I would like to add two reminders. First, that knowledge of the cause of luteinising hormone deficiency would be of more value towards prevention than any amount of information as to the correct use of this hormone. Second, that in many cases sexual dysfunction is nature's reaction to a reduced level of health, and attention paid to general condition and management may produce much better results as a long-term policy than forcing the sexual organs of a worn-out animal to continue working. Finally, though I can find no reference to the hereditary factor in the description of hormonal disturbances, we must bear the possibility in mind, and if heredity does play a part surely we are storing up trouble for the future by continuing to breed from these animals?

References

Burroughs Wellcome & Co. (1949.) "The Sex Hormones in Veterinary Practice."

Dukes, H. H. (1947.) "The Physiology of Domestic Animals." 739-779.

Jull, Professor, U.S.A. (Quoted by Blount, W. P.—Private communication.)

Opening of Discussion

Miss B. M. Penhale (Addlestone, Surrey) opened the discussion as follows: I am particularly pleased to be afforded the opportunity, this afternoon, of opening the discussion on Miss Brancker's paper because, during the last five years, luteinising hormones have established a place of importance in all aspects of veterinary practice, and also because whatever else we may or may not be doing for the "Western Counties" this afternoon, we are adding to their history. Never before, I understand, at this meeting, have women members been permitted to take the reins. I must congratulate Miss Brancker upon her very thorough paper; in fact, she leaves me little to add.

I have not had a great deal of experience of large-animal practice, but have found that in the cases of persistent early abortion in cattle, where trichomoniasis has been proved non-existent, injections of 1,000 I.U. of luteinising hormone have proved successful. I have not, as has Miss Brancker, injected at two and a half, five and a half and eight and a half weeks, but at eight and again at ten weeks after service, when pregnancy has been diagnosed previously—the reason for the delay being that, if the confirmation of pregnancy at an early stage were not definite, and luteinising hormone used, a state of non-visible heat would be produced in the cow for several months and, therefore, be a monetary loss to the farmer.

In the sow I have used luteinising hormone for the stimulation of lactation. The dose used was 400 I.U. intramuscularly.

I have used this similarly in the bitch, in conjunction, here, with posterior pituitrin. In cases of bitches whelping down with little or no mammary gland development, and therefore little or no milk, posterior pituitrin used alone does not appear to suffice, but with the addition of 200 I.U. of luteinising hormone daily for two days results have been successful.

Regarding the use of luteinising hormone in the bitch for pyometra, I agree that in cases of what I call haemorrhagic pyometra, and what I think Miss Brancker terms persistent heat, injections of luteinising hormone yield excellent results. In cases of the purulent pyometra, however, I have not had good results in practice and, theoretically, I fail to see why it should be effective.

In the normal oestrous cycle of the bitch corpora lutea occur after oestrus and persist for eight or more weeks. During this pseudo-pregnancy phase so-called uterine milk is secreted and it is presumably the accumulation of this with an endogenous infection that is the origin of pyometra.

The action of luteinising hormone on the uterus is to maintain pregnancy and inhibit the action of the posterior pituitary and so stop contraction of the uterus.

How, then, is luteinising hormone to work in pyometra?

It would seem that oestrogens and not their antagonists—luteinising hormones—would be the remedy. Stilboestrol, the synthetic oestrogen, has proved dangerous in its complications, *i.e.*, hyperaemia of the uterus and generalised spread of infection by the blood stream, and for the pet bitch with an early pyometra hysterectomy is such a safe and definite operation that I still favour the knife.

In the young male dog I have had good results with luteinising hormone in cases of cryptorchidism. It has been used intramuscularly in dosages of 300 I.U. weekly for five weeks.

Also in the young male dog, which at the age of puberty and onwards suddenly loses its belligerent male characteristics and becomes virtually a female—both in temperament and in its attrac-

(*Concluded at foot of next column*)

THE REPAIR OF TIBIAL FRACTURES BY INTRAMEDULLARY PINNING

BY

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There can be no doubt that fracture repair by the intramedullary pinning operation is now superseding the older methods. Its advantages are :—

(1) Perfect reduction.

(2) Good immobilisation of fragments.

(3) Lessened discomfort to the animal in that it is able to use the limb and support its weight very shortly after operation—thus avoiding atrophy of muscles and preventing pressure sores such as occur after plaster technique.

In addition, with this type of operation the practitioner meets none of the other snags that occur with plaster. For instance, the cast is often removed by the animal, and naturally increases expense and dissatisfies owners, whereas a well-performed pinning operation provides mutual satisfaction to surgeon and owner.

Femur, tibia and humerus are the bones most suitable for pinning. When dealing with the femur, especially in fat animals, it is often necessary to perform an open reduction and then pin, as the structures are not easily palpable. Occasionally the humerus may require open reduction also.

The tibia is palpable without difficulty even in fat animals, and this gives the best opportunity for so-called "blind pinning."

The technique I use in pinning a transverse mid-shaft fracture of the tibia is as follows :—

With the animal lying on the uninjured side and the leg flexed at the stifle joint, traction is applied by means of padded ropes to both distal and proximal fragments. Sufficient time must be given for complete muscle relaxation. Patience is required to achieve this and it will sometimes take as long as 60 minutes. However, the animal's condition should not deteriorate while under a general anaesthetic for that length of time as long as body temperature is maintained with the use of an electric pad or a hot-water bottle. The fragments then having been reduced manually, an intramedullary pin is inserted just medial to the middle patellar ligament, and then driven along the medullary cavity. Screening or a single X-ray plate will confirm the direction and the position of the end of the pin. With practice it is possible to insert the pin into the medullary cavity of the distal fragment without any help of screening or plate.

Having confirmed that the pin is in the medullary cavity of the distal fragment, it is driven on well into the epiphysis, so that firm insertion is palpable. The pin is then withdrawn slightly from the proximal fragment, filed off just above the skin, then tapped down again underneath it.

Fifty thousand units of procaine penicillin are injected through the opening in the skin.

The thickness of the pin should be carefully chosen to conform with the size of the medullary cavity as confirmed by the initial X-ray.

As a rule, the animal is discharged the day after the operation and advice given that if its general condition is satisfactory an X-ray should be taken in one month's time. I find it is best to leave the pin inside for two months after which time there is usually very firm union.

Withdrawal of the pin is done under local anaesthesia. A small incision is made and the pin is gripped by Arnold's pin chuck. The pin is then withdrawn with a gentle rotary movement. Procaine penicillin is again injected along the pin track.

Summary

(1) Advantages of the intramedullary pinning operation over plaster technique are discussed.

(2) A brief description of technique of operation is given.

(3) X-ray plates to illustrate the three stages of the operation are included. In this case open reduction was used as the fracture was three weeks old when treated.

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tion to other males of its species—and therefore a surprise and anxiety to its owners, I have used luteinising hormone in dosages of 300 I.U. weekly for three weeks.

One such similar case, however, in a Bull Terrier dog, aged 18 months, responded well to treatment for a short while and then fell victim to its former habits. It was injected again with twice the dose and for a longer duration, returned to normal for a short period and then returned to the surgery. I waited until I had a castration to perform on a Collie dog and grafted part of one of the testicles into the belly of the internal oblique muscle in the flank of the Bull Terrier. The dog certainly changed its ways, and still has, a year later; in fact now in its neighbourhood both dog and man stand in awe!

In conclusion, I would like to thank Miss Brancker for coming all this way and presenting to this meeting such an interesting paper on a relatively new subject. She certainly has given us much food for thought, so we look forward to a lively discussion.

"PURE BRED OR CROSS BRED?"

In its issue of January 22nd the *Farmer and Stock-breeder* comments on the above question as follows: "Deliberations of the British Cattle Breeders' Club have thrown into prominence a matter of vital interest to breeders in this country. Following the work started by Dr. L. M. Winters with his Minnesota strains of inbred pigs and, of course, influenced fundamentally by the tremendous success of hybrid maize, the tendency in America is now to think that the advantages of hybrid vigour are greater than those to be secured by pure breeding to a specialised specification.

"Because of the prominence of dairying in this country we are inclined to think in terms of pure breeds of cattle, though in the case of beef there is a strong tradition in favour of cross-breds, such as the blue-grey and others. When it comes to sheep our commercial practice is based almost entirely on first and second crosses, and this has been immensely successful. Even in pig production many commercial producers favour the first cross.

"Both milk recording and pig recording have led us to think along the lines of selection within a breed for high all-round production. The significance of what is being done in America is that breeds or strains are being selected intensively, not for all-round efficiency but rather for individual qualities, after which first and second crossing brings together two or more desirable qualities in one animal with the added advantage of hybrid vigour.

"Just what these new moves signify to our pedigree breeders must be studied carefully. It may mean more concentration on special qualifications within individual breeds. What is not clear is whether we should keep all the existing breeds or whether some of them shou'd be separated into different strains specialising in different characteristics.

"If we are to expand our exports we must be prepared to compete very strongly with the product of the newer breeding ideas which are accepted as part of general practice in America."

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Medical Research Council Chairman.—By an order of the Committee of Privy Council for Medical Research, Lord Limerick has been appointed a member of the Medical Research Council. With the approval of the Committee of Privy Council, the Medical Research Council has appointed Lord Limerick to be Chairman of the Council in succession to the late Lord Addison.

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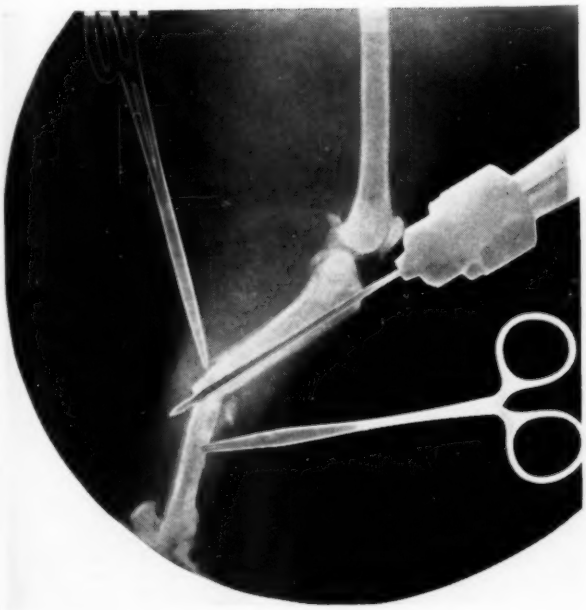
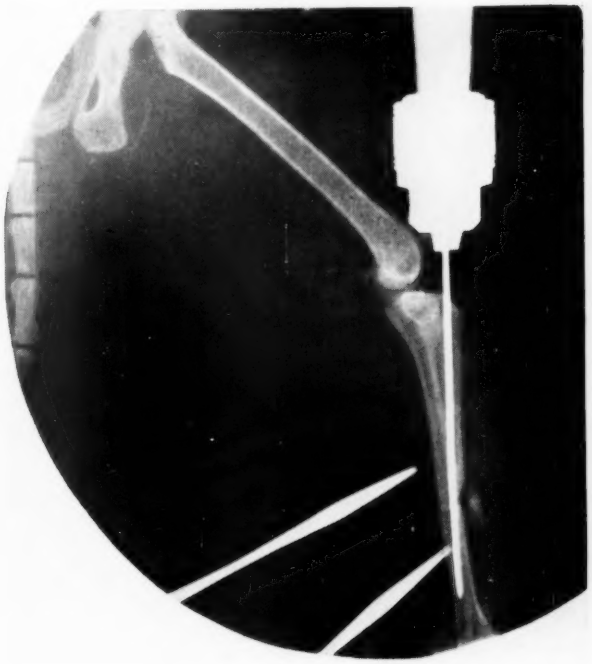
Weekly Wisdom

Most of the world's best work is done "against the grain."—*A Times* Correspondent.

Z. D. VINCENT: REPAIR OF TIBIAL FRACTURE BY INTRAMEDULLARY PINNING

(Plates Illustrating the Three Stages of Operation)





CLINICAL COMMUNICATIONS

STREPTOMYCIN IN THE TREATMENT OF SINUSITIS IN TURKEYS

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With the marked increase in development of the turkey industry in the British Isles, a number of conditions which were of little or no economic importance and which passed more or less unnoticed, are now coming to light. One of these is the disease known as sinusitis. This is characterised by the development of a bubbly secretion in the eyes, rapidly followed by a swelling of the infra-orbital sinuses. The latter may swell to such an extent as to make the birds completely blind and prevent them from feeding. Although birds do not appear to be generally depressed they are apt to lose weight, the growth rate subsequently being seriously retarded.

Whilst, until recently, the treatment of the condition has been empirical and largely ineffectual, the introduction of streptomycin has revolutionised the position. This preparation was tested by Hitchner (1949). One hundred and fifty mg. dissolved in sterile water were injected into each sinus and produced a remarkable recovery in 20 out of 21 birds in 7 to 10 days. *Post-mortem* examinations, carried out as part of the experiment subsequent to recovery, revealed the sinuses to be completely free of exudate in from 7 to 23 days following injection. The same author attempted to cure the disease by inoculating birds in the dewlap; two of the birds were given 150 mg. and three 250 mg. All responded well, recovering completely in from 8 to 15 days. McArthur (1950) originally used sulphamezathine, injecting this either intravenously or directly into the sinuses, but had no success by this method. Later he used 100 to 150 mg. of streptomycin, securing a recovery in 90 per cent. of his patients after one injection, the 10 per cent. of resistant cases responding to a second treatment. He reported improvement in the first group of birds at three days and almost complete recovery by the end of the fifth day. More recently Olson (1951) carried out a somewhat more extensive survey, using 100, 150 and 200 mg. doses. Seventy-nine per cent. of the last group, 90·9 per cent. of the middle group, and 88 per cent. of the group which received 100 mg., recovered in from 3 to 20 days.

In view of the favourable findings recorded by the above authors, we took the opportunity provided by a small but severe outbreak of the disease to test the efficacy of the treatment in this country.

History

The turkeys, which were of the Bronze breed and hatched from range-kept breeding stock, were purchased when three weeks of age and kept for the remainder of their life on wire-floored verandas. Up to 14 weeks they received National Baby Chick Mash, at which age they were put on to National Chicken Growers' Mash plus liberal quantities of chopped lucerne. This ration would at least ensure an adequate intake of vitamin A, lack of which, therefore, could not be regarded as a cause of the sinusitis.

Symptoms

The owner first observed symptoms of swollen sinuses on August 1st, *i.e.*, at 11 to 12 weeks of age.

On August 1st the owner suspected that the trouble was blackhead and had all the birds inoculated accordingly. Little or no response was observed and on August 25th we were able to investigate the outbreak and proceed to carry out the treatment recorded below.

Twenty birds were seen. Nine birds were showing symptoms that included swelling of either one or both sinuses, a clear nasal discharge and slight foaming of the ocular secretion in some birds.

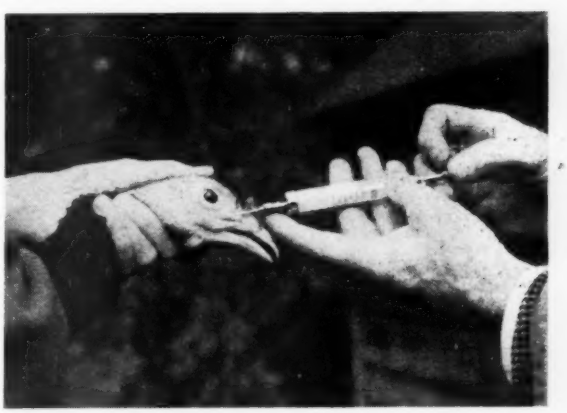
The birds appeared listless and the owner reported that their appetite had become very poor and was negligible in the worst cases. One bird, No. 1, had extremely large sinus swellings that occluded both eyes entirely. It is probable that this bird would have succumbed in the course of a few days, as it was unable to feed. Both nostrils of this bird were completely obstructed by dried exudate.

On handling, the affected birds were found to be in poor condition.

Treatment

Treatment commenced on August 28th.

The swollen sinuses were drained and each sinus was injected with 100 mg. streptomycin sulphate dissolved in 2 ml. of sterile water. No. 6 needles were used and, once pierced, the needle was left in the sinus until both draining and injection had been completed. Eight birds were treated and two birds with typical swollen sinuses were left untreated as controls. Ten birds without symptoms were not treated. The fluid drained from the sinuses varied in consistency from that of pure water to that of a viscous jelly-like mucus. In colour it was milky-white and translucent. None was found to be cheesy or even semi-solid. The volume extracted from each sinus was measured separately in case the degree of distension might be related in any way to the rate of recovery. It varied from 18 ml. from each sinus in one bird to an average of 5 ml. in each sinus for the remaining 10 birds treated.



Results

The birds were examined on August 31st and a remarkable improvement was seen. The eyes were bright and healthy, the foam round the eyes had ceased and the nostrils had become quite dry. The owner had reported that appetite had returned. Both right and left sinuses in Bird No. 1 and the left sinus in Bird No. 2 were still slightly swollen.

The remaining treated turkeys apparently had recovered. On September 1st, Birds Nos. 1 and 2 were drained and given a second injection, in both sinuses in the case of No. 1 and only the left in No. 2. All remaining birds treated had apparently recovered by September 1st. One new case of sinus swelling was seen, and this was treated—left sinus only (September 1st).

On September 3rd it appeared that all treated birds had recovered. Birds Nos. 1 and 2 still seemed somewhat swollen in one sinus but on investigation the swelling was discovered to be due to air.

Discussion

Whilst some operators prefer to inject the streptomycin without removing the sinus contents, thereby saving time, we decided to evacuate in all cases. The injection appeared to have a very stimulating effect upon the general health of the birds and no sooner had the swelling disappeared than the birds commenced to eat. This observation favours the evacuation method though where a large number of birds is being treated, this procedure may be impracticable. At the beginning of an outbreak it is desirable to treat all birds in order to prevent further spread. It is possible that the rapid recovery which we achieved by the injection of 100 mg. —a dose which is the lowest employed by any of the authors above referred to—may be explained in part by the fact that the outbreak had been in existence for some time before treatment was introduced and natural recovery may have commenced. However, the outbreak was brought to such a rapid conclusion that it is clear that the streptomycin treatment was effectual. One case did in fact develop after treatment had begun, showing that infection was still active. The method is so simple that it would seem worth while applying whenever such cases occur, and might be used to some effect in cases of ordinary coryza.

Summary

A description is given of an outbreak of sinusitis in a small flock of turkeys. The infection was successfully treated by injecting 100 mg. of streptomycin sulphate, dissolved in 2 ml. of sterile water, into the infra-orbital sinus after evacuating the contents.

Acknowledgment.—I would like to express my indebtedness to Mr. Ray Feltwell and Mr. L. Forcey, of the N.A.A.S., for their co-operation and for collecting the details and making regular observations in this case.

References

Hitchner, S. B. (1949.) *Poult. Sci.* **28.** 627-629.
McArthur, F. X. (1950.) *J. Amer. vet. med. Ass.* **116.** 230.
Olson, N. O. (1951.) *Ibid.* **118.** 174.

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FILARIASIS OF DOGS IN CEYLON

Treatment with Diethylcarbamazine

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Filariasis is very common in dogs in Ceylon. Crawford (1933) found that about 30 per cent. of the street dogs in Colombo had filariaemia but few of these suffered in health. On autopsy adult worms were found in the subcutaneous tissue between the skin and muscles, especially of the ribs and flanks ; he assumed that the species was *Dirofilaria repens.* Here it may be mentioned that Von Linstow (1906) recorded the finding of *D. immitis* adult worms in the heart of a dog in Ceylon, but judging from Crawford's findings and personal observations this infestation must be rare in Ceylon.

The present writer has examined the blood of 50 dogs brought to the clinic for diagnosis. In 16 cases, microfilaria were found and filariasis appeared to be the cause of the clinical condition present. The clinical signs included lassitude, anorexia, cough, emaciation, epistaxis, pruritus and intractable eczema, but rise in temperature was not a feature. All the dogs had been kept in river valleys where the mosquito carriers abound ; 11 of the 16 were short-haired dogs.

The owners in 13 cases were advised to treat the dogs with diethylcarbamazine. The history, clinical signs, dosage and results are listed in the table. One owner declined to give the drug as the dog disliked tablets *per os* and as mating was to take place soon. In another case, the dog developed "hard pad distemper" soon after the commencement of treatment and died from encephalitis ; in yet another case, the drug was given at the clinic but the dog was in the last stages and died.

The subsequent history of several dogs is somewhat indefinite as the owners or veterinarians have not been able to bring the dogs for re-examination but have reported improvement or apparent cure. Burkhart (1951) states that in the U.S.A. there are conflicting opinions on the question of continuing the course of diethylcarbamazine until there is complete elimination of microfilaria. Some veterinarians consider that as soon as there is clinical cure, administration of the drug should cease ; others contend that it should be given until there is complete eradication. As compared with the results obtained in *D. immitis* infection by Hewitt and his colleagues (1947, 1948), by Purchase (1950), Ziegler (1950), Alley (1950) and Foley (1950), those obtained in Ceylon have been disappointing. The reason may be that most, if not all, cases of filariasis encountered have been infected with *D. repens.* In cases 2 and 13 this parasite was actually found, *post-mortem* in 2 and escaping through the skin during life in 13. In cases 1, 3 and 16 adult worms were not found and, as Armistead (1950) suggests, the adults sometimes may lodge in some unusual site.

It will be noted that in cases 2 and 12 very prolonged courses of the drug have not brought about the dramatic cures reported by others in cases of *D. immitis* infection. Nevertheless, there is some evidence of effect on microfilaria and adults.

Case 13 is particularly interesting as at least four adult worms migrated through the skin to the exterior soon after treatment commenced. This case is also interesting in as much as it was the first case of toxic or allergic reaction encountered. Administration of an antihistamine drug, as recommended by Burch (1950) in a review of the treatment of onchocerciasis in man, alleviated the condition but the owner decided on euthanasia.

Discussion

Foley (1950), in an extensive and detailed report on the treatment of *D. immitis* infection, states that there is no universally successful treatment. However, he found that the administration of "Caricide" (diethylcarbamazine-Lederle) *per os* and of caparsolate sodium (Abbott) intravenously, gave better results than any other treatment ; his latest treatment was the administration of both drugs simultaneously ; all 10 dogs treated thus made rapid recoveries, the blood being clear of microfilaria in 15 days and remaining negative for at least six months.

Foley (1950) also recommends supportive treatment, the daily oral administration of ferrous sulphate and vitamin B complex, a diet consisting of 50 per cent. beef, 30 per cent. dried dog feed and 20 per cent. whole milk ; in addition, multivitamin and liver concentrates, minimum doses containing 5,000 U.S.P. units of vitamin A, 1,000 U.S.P. units of vitamin D, 1 mg. of B_1 and B_2, 0·5 mg. of B_6, 10 mg. nicotinic acid, 60 mg. ascorbic acid and 350 mg. of insoluble liver fraction.

Case No.	Breed	Age, years	Clinical signs	Approximate No. of microfilaria per two-thirds field	Dose of diethylcarbamazine	Period of treatment, weeks	Results	Remarks
(1) S.J.	Airedale, male	7–8	Lassitude; skin lesions; ascites	5–7	—	—	—	Had been affected for over two years. Antimony compound given. Euthanasia; splenic tumours, chronic nephritis. No adult worms found.
(2) G.J.	Mastiff × Gt. Dane, male	7–8	Lassitude; skin lesions	5–7	600 mg. per day, increased to 1,600 mg. per day	6	Slow clinical improvement. Reduction of number of microfilaria to an occasional single microfilaria in a field.	Same owner as in case (1). Treatment began in March, 1950, and lasted 12 weeks. Dog remained well until December, 1950; died after brief illness. On *post-mortem* examination, pleurisy and pneumonia. A single live adult female worm found in subcutaneous tissue.
(3) D.A.	Beagle, female	3	Lassitude; scratching	3–4	300 mg. *t.i.d.*	2	Dog developed hard pad distemper, encephalitis, and died.	On autopsy, neither adults nor microfilaria were found.
(4) T.S.	Harrier, male	2	Lassitude	1–2	400 mg. *t.i.d.*	4	Clinical improvement.	After 10 days microfilaria still present; after four weeks, complete eradication.
(5) M.N.	S. fox terrier, male	3	Scratching; skin lesions	2–3	200 mg. *t.i.d.*	3	Clinical improvement reported.	Dog not brought back for re-examination.
(6) S.S.	Beagle, male	4	Lassitude; extreme weakness	3–4	400 mg. *t.i.d.*	1	Clinical improvement reported.	Owner reported another beagle on the premises similarly affected. Was treated for about a week with "Caricide" and recovered.
(7) P.V.S.	Greyhound, male	2	Extensive skin lesion; lassitude, scratching	5–6	400 mg. *t.i.d.*	—	—	—
(8) M.A.B.	Alsatian, female	3	Occasional epistaxis; emaciation; lassitude; anaemia	1 in 3 drops of blood	400 mg. *t.i.d.*	3	No improvement; died.	This dog had been ailing over a year; autopsy performed by another veterinarian; no adult worms found; pneumonia.
(9) J.H.	Ridgeback × Kangaroo hound, male	4	Lassitude; skin lesions; deafness	2 or 3 found in centrifuged blood	500 mg. *t.i.d.*	4	Slow clinical improvement reported. Examined about one year later and found negative.	Diagnosis made from sample of blood sent by post. Dog had been in poor health for six months.
(10) W.M.	Ridgeback	3	Skin lesions; cloudiness of anterior chamber of eye	3–4	400 mg. *t.i.d.*	—	Clinical improvement reported.	Dog brought to clinic for treatment of wound in neck.
(11) W.F.	Boxer, female	3	Pruritus of skin only	5–6	—	—	—	Owner refused treatment as bitch was due for mating.
(12) A.Y.	Cairn terrier, male	5	Skin lesions; cloudiness of anterior chamber of eye	6–7	200 mg. *t.i.d.*	4	Only slight clinical improvement.	After four weeks, slight drop in numbers of microfilaria.
(13) M.R.	Cocker Spaniel, male	7	Skin lesions; emaciation; lassitude; cloudiness of anterior chamber of eye and anaemia	6–7	100 mg. *t.i.d.*, increased to 150 mg. *t.i.d.*	—	Violent allergic reaction to initial dose of 200 mg. Abdominal spasms followed by exhaustion. Single adult worm found emerging from the skin on four occasions in the course of 10 days after beginning treatment.	Euthanasia carried out by owner; no *post-mortem* examination.
(14) O.S.	Alsatian, male	4	—	4 or 5	—	—	—	Owner was a veterinarian; advised to give "Caricide." No subsequent history.
(15) Sav.	Alsatian	9	—	4 or 5	—	—	—	—
(16) Per.	× - bred terrier, male	—	—	5 or 6	400 mg.	—	—	This dog had generalised enlargement of the lymph glands; the left sub-maxillary and left prepectoral glands were removed; in the latter there was a pocket of pus containing streptococci and some microfilaria. On *post-mortem* examination patchy consolidation of the lung, nodules in liver and spleen, pleural and peritoneal effusions. No adult worms found.

It is obvious that satisfactory treatment of filariasis in dogs is expensive and indeed it would appear that, in localities where the infection is common, it would be much better to adopt prophylactic measures by administering "Caricide" in doses of, say, 10 mg. per lb. bodyweight at intervals of three months to puppies from the time they are weaned. This drug has the added advantage of being active against ascarids and the larval stages of *Ancylostoma caninum* and *A. brasiliense*.

With reference to the methods of diagnosis of filariasis, Burch and Blair (1950) have advocated mixture of 2 c.c. of venous blood with 1 c.c. of a solution known as Filtest, made by Pitman-Moore & Co., Indianapolis, Indiana, U.S.A.; the mixture is centrifuged for one minute at 4,500 r.p.m. and the deposit examined under the low power of the microscope. The erythrocytes are lysed but the microfilaria remain motile and are detected easily. These authors state that in *D. immitis* infection there is no periodicity and that therefore nocturnal sampling is unnecessary. Schnelle (1951) takes exception to this statement and recalls the definite periodicity demonstrated by Schnelle and Young (1944). No observations have been made on periodicity in *D. repens* infection, and it is quite possible that this phenomenon accounts for the failure to find microfilaria in many dogs examined by the present author, although they were showing signs suggestive of filariasis.

Summary

1. The incidence of filariaemia in pure-bred or well-cared-for cross-bred dogs in Ceylon is approximately 33 per cent., *i.e.*, about the same as that found in street dogs by Crawford in 1933.

2. In two dogs adult *D. repens* were found: in three other dogs no adult worms were found on *post-mortem* examinations.

3. It would appear that *D. repens* is the species of filaria most commonly infecting dogs in Ceylon.

4. Nine affected dogs were given prolonged courses of diethylcarbamazine, all except one at a dosage of 10 mg. per lb. bodyweight three times a day.

5. Clinical improvement and reduction in the numbers of microfilaria have been slow as compared with the results recorded in the treatment of *D. immitis* infections in the U.S.A. and Africa.

6. One case of violent allergic reaction to the drug was encountered; in this dog adult worms migrated through the skin to the exterior soon after the course of diethylcarbamazine was begun.

7. Prophylactic treatment with "Caricide" in districts where infection is common would seem to be advisable.

Acknowledgments.—I have to acknowledge the gift of a supply of "Caricide" (diethylcarbamazine) from Messrs. Lederle Laboratories Division.

References

Alley, J. C. (1950.) *Vet. Rec.* **62.** 522.
Armistead, W. W. (1950.) *Vet. Med.* **45.** 267.
Burch, G. R., & Blair, H. E. (1951.) *Ibid.* **46.** 128.
Burch, T. A. (1950.) Observaciones referentes al Traramiento de la oncocercosis con Suramina y Hetrazam. Publicacion especial de la Direccion General de Sanidad Publica, Guatemala.
Burkhart, R. L. (1951.) Lederle Laboratories Division, private communication.
Crawford, M. (1934.) Administration Report of the Government Veterinary Surgeon for 1933. Colombo: Ceylon Government Press.
Foley, R. J. (1950.) *Vet. Med.* **45.** 485.
Hewitt, R. I., *et al.* (1947.) *J. Lab. clin. Med.* **32.** 1304.
———. (1947.) *Ibid.* **32.** 1314.
———. (1948.) *Ann. N.Y. Acad. Sci.* **50.** 128.

(*Concluded at foot of next column*)

Von Linstow. (1906.) *Spolia zeylan.*
Purchase, H. S. (1950.) *Vet. Rec.* **62.** 34.
Schnelle, G. B. (1951.) *Vet. Med.* **46.** 211.
——— & Jones, T. C. (1945.) *J. Amer vet. med. Ass.* **107.** 14.
——— & Young. (1944.) *Bull. U.S. Army Med. Dept.* Sept., 1944. Cited by Schnelle, 1951.
Ziegler, C. G. (1950.) *J. Amer. vet. med. Ass.* **116.** 209.

ABSTRACTS

A Serological Test for the Diagnosis of Tuberculosis in Cattle*

The test is based on the haemolysis of sheep erythrocytes, coated with an extract of the human type of tubercle bacillus, which occurs if appropriate antibodies and guinea-pig complement are present. Examination of sera from cattle experimentally inoculated with heat-killed mycobacteria showed that antibodies causing haemolysis in this test were produced not only by inoculation of mammalian types of tubercle bacilli but also by inoculation of the avian type or *Myco. johnei*.

The test appears to offer no advantages over the tuberculin test.

J. F.

* **Studies on a Serological Test for the Diagnosis of Tuberculosis in Cattle.** Fisher, S., & Gregory, T. S. (1951.) *Austr. vet. J.*, **27.** 25.

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B Vitamin Deficiencies of Pigs Raised on Farms*

From 11 different farms in Michigan 80 individual cases of enteritis in pigs were collected for study. The cases were termed "nutritional enteritis" and were characterised by a severe enteritis involving the caecum and colon: they represented the poorest of the animals seen on the farms. The daily urinary excretion of vitamin B_1, riboflavin, pantothenic acid, nicotinic acid and N^1-methylnicotinamide, was determined on samples taken in metabolism cages and the animals were treated by the intraperitoneal injection of vitamins B_1, B_6, riboflavin, nicotinic acid and calcium pantothenate. Of the 80 animals 11 did not respond and died with lesions of enteritis, pneumonia, or both, and in one case of colonic adhesions and enteritis. The remaining 69 made excellent recoveries, and with surprisingly good growth gains.

The initial urinary outputs indicated a deficiency of nicotinic acid. The average excretion of N^1-methylnicotinamide was only 4·85 mg. per day, whereas after the enteritis had been cured the average daily excretion had risen to 16·75 mg. The average daily excretion of nicotinic acid itself was 0·58 mg. before treatment and 3·09 mg. afterwards. In view of the normally wide variation in urinary pantothenic acid excretion in the pig, it was more difficult to assess the values recorded before and after treatment. In some instances, however, the initial excretion was of a low order (0·2 to 0·3 mg. per day) and seemed indicative of deficiency, and the values throughout averaged only 0·77 mg. per day, compared with 3·08 mg. per day after the animals had been cured. The average values for the other vitamins before and after treatment were, respectively, riboflavin 0·30 mg. and 0·95 mg. per day, and vitamin B_1 0·29 and 0·96 mg.

* **A Study of B Vitamin Deficiencies of Pigs Raised on Farms.** Luecke, R. W., Thorpe, F., Jun., McMillen, W. N., Dunne, H. W., & Stafseth, J. W. (1949.) *Technical Bulletin No. 221 of the Michigan Agricultural Experiment Station*, pp. 23.

per day. [The significance of these values would be more apparent if they were related to the bodyweights of the animals at the time.—*Abstractor.*]

A description is given of the haematology and histopathology of cases slaughtered without treatment. The lymphocytel polymorphonuclear ratio was altered in a manner to that hitherto recorded in experimental cases of nicotinic acid deficiency. The lesions of the caecum and colon were characterised by the thickening and the accumulation of exudate on the mucosa. The epithelium showed mucoid degeneration, necrosis and ballooning of the glands. Streams of mucus were observed coming from the glands towards the surface. Inflammatory cells were also present.

A. N. W.

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Photoperiodicity in the Female Ferret*

The object of the experiments was to investigate whether in summer-breeding animals the stimulus of oestrus is the amount of light or the amount of darkness occurring per 24 hours.

In September to March, 1947-48, eight mature but anoestrous ferrets were arranged in four pairs and enclosed so that the experimental groups received natural daylight plus artificial light from 40-watt fluorescent "daylight" tubes.

Group I.—The dark period was divided equally into two periods by one hour's artificial light.

Group II.—The dark period was divided equally into two periods but the duration of the artificial light was increased by half an hour every three days.

Group III.—The exposure to artificial light was as in Group II, but the artificial light was given at the end of the day.

Group IV.—No artificial light.

All experimental animals came into oestrus after a period of 50 to 67 days. The controls remained anoestrous for 117 days.

This experiment shows that the total daily quantity of light is not the stimulating factor for the onset of oestrus, since Group I and the controls had approximately the same amount. The sequence of long-light to short-dark periods appears to be more important, for the exposure to artificial light of Group I for only one hour achieved this rhythm in contrast to the control group which received a short-light, long-dark rhythmical stimulus.

In September to March, 1948-49, 30 virgin anoestrous ferrets were available for experimentation and they were arranged in three groups of eight with a group of six as controls.

Group A were exposed to natural daylight and artificial light for 24 hours for the first 11 weeks of the experiment and then to 24 hours artificial light for the remainder of the time. The onset of oestrus was variable (9 to 21 weeks) with a mean latent period of 16·6 weeks.

Group B, exposed to a sequence of eight hours light—four hours darkness, showed oestrus after a mean latent period of 11·25 weeks (9 to 16 weeks).

Group C, exposed to a sequence of 16 hours light—8 hours darkness, showed oestrus after a mean latent period of 7·67 weeks (6 to 10 weeks).

The control group showed oestrus after 23 to 24 weeks from the onset of the experiment.

Group B, after subjection to a further exposure to 4 hours light—20 hours dark rhythm, showed anoestrus in 3·91 weeks (two to five weeks). Group C, on an 8 hours light—16 hours dark "ration" showed anoestrus in 6·3 weeks (3 to 23 weeks).

Ferrets from Group B and Group C, from this last experiment, subjected to sequences of four hours light—two hours darkness, showed a mean latent oestrus period of 5·5 weeks (three to nine weeks).

As a result of these experiments the author suggests that in the ferret the onset of oestrus or anoestrus is not controlled by the daily quantity of light, but by sequences of light and dark. A proportion of two parts light to one part darkness induces oestrus and a reversal of the sequence induces anoestrus. It is possible that the stimulus of light and dark is mediated by the eye and hypothalamus to affect activity of the pituitary gland. Increasing the number of stimuli per 24 hours does not appear to speed up the onset of oestrus to any marked extent.

It is mentioned incidentally that in those animals exposed to continual light, blindness occurred after four months with wasting and death in some cases. The lesion was unilateral in some instances and may have been due to an organism.

F. R. B.

* **Photoperiodicity in the Female Ferret.** Hart, D. S. (1951.) *J. Exp. Biol.* **28.** 1.

REVIEW

[**Diseases of Poultry.** By T. G. Hungerford, B.V.Sc., H.D.A. (Second edition.) Angus & Robertson, Ltd., 48, Bloomsbury Street, London, W.C.1. Price 63s.]

This book was originally designed for poultry farmers, and in this second edition it has been enlarged to include more scientific detail, which makes it a useful reference book for veterinarians. The book has been written, however, with particular reference to poultry diseases as they occur in Australia ; consequently, diseases such as Newcastle disease, fowl typhoid and infectious bronchitis receive comparatively little attention. Pullorum disease is dealt with in some detail, especially methods of control and prevention, but other salmonella infections are treated summarily. There is a total of 15 chapters dealing with bacterial and viral diseases, deficiency diseases, and internal and external parasites. Also included are chapters on poisoning, on feeding and management, on disinfection and fumigation, on hatchery problems, and two chapters on diseases of turkeys and diseases of ducks. The book also contains more than 80 figures and 86 tables.

ZOOLOGICAL SOCIETY SECRETARY

At an ordinary general meeting of the Zoological Society of London, held last week, the forthcoming retirement of Dr. Sheffield A. Neave from the Secretaryship was announced, and Lord Chaplin was recommended for election in his place. The change of Secretary will take place at the annual meeting on April 29th.

Dr. Neave, who has been a Fellow of the Society since 1909, and was formerly Director of the Imperial Institute of Entomology, became Secretary in 1942. He first joined the Council of the Society in 1933. Lord Chaplin has been a Fellow since 1925 and a member of the Council from 1934 to 1938 and since 1950. His zoological interests are wide, but perhaps principally in birds, reptiles, and amphibians. He has given examples of many species to the Society.

* * * * *

Last year 390,000 birds were slaughtered in 844 outbreaks of fowl pest which occurred in Great Britain ; the sum of £470,000 was paid in compensation.

REPORT

[**Southern Rhodesia**: Report of the Director of Veterinary Services for the Year 1950.]

The staff position of the department has improved greatly and the time has come when veterinary service can be given to the dairy industry. Regular inspection of dairy herds supplying milk to large towns is held to be essential. The department is also responsible for meat inspection.

The year was not a good one for stock and the rainfall was inadequate.

Tick life in the colony has increased in the past few years and with it an increased mortality from tick-borne diseases such as Theileriosis, piroplasmosis (redwater), anaplasmosis (gall sickness) and heartwater. There has, however, been a decrease in African Coast fever. Significantly, in A.C.F. areas compulsory dipping is in force throughout the entire year ; in other areas it is in force for only a part of the year. On the subject of dipping, the Director remarks that while fresh solutions of gammexane (B.H.C.) dip have spectacular "knock down" effects, old solutions have failed to control tick life, and the opinion is firmly held that a good quality arsenical dip is the best and most stable tick-destroying agent. However, the addition of fresh solutions of gammexane to arsenical dips is a recognised advantage to control sudden flushes of tick life, and lice and fleas.

There were two incidents of importance during the year. One, an outbreak of foot-and-mouth disease, and the other an outbreak of rabies. Strict quarantine regulations combined with the inoculation of incontacts dealt with the first.

The colony has been free of African Coast fever for two and a half years.

Theileriosis, a disease which is not always easy to distinguish from A.C.F., occurred in several areas and deaths were reported. Anthrax also appeared in isolated outbreaks and was dealt with by large-scale vaccination. The origin of one outbreak involving three bulls was traced to grain imported from a native reserve where the disease had already appeared.

Tuberculosis is a disease which is more and more coming into the picture. While ranching cattle are particularly free of the disease (three per 10,000 slaughtered) it is otherwise among dairy herds. Here the incidence in some cases has reached the figure of 23·6 per cent. The average incidence, however, is about 10 per cent. The disease is being tackled vigorously by the department. Among 864 head of imported cattle tested for tuberculosis five reactors were disclosed and destroyed.

As already stated, a matter of considerable moment was the reappearance of rabies in the colony after it had been absent since 1913. The disease reached the colony from Bechuanaland, whence it had also spread to South Africa. Contagious vaginitis and epididymitis (epi-vaginitis) has continued to occur and in new centres. Artificial insemination has improved the situation, especially in some dairy herds. Native bulls show a resistance to the disease and are used in herds in which artificial insemination is impracticable.

Trypanosomiasis showed a high increase in some native reserves and nearly 12,000 cattle received treatment with phenanthridinium with good results. Mortality was checked immediately. Seventy-three per cent. of the cases were caused by *T. congolense*, 20 per cent. by *T. vivax*, and 7 per cent. by a mixed infection of *T. congolense* and *T. vivax*.

Quarter-evil is widespread. The high incidence could be prevented by the more general application of calfhood vaccination. Many deaths from horse sickness occurred during the year, and it is considered that the vaccine has failed to protect against aberrant strains of the virus.

Poultry diseases have also engaged the attention of the department. B.W.D. disease appeared in the colony during the year and testing of flocks and elimination of infected birds were carried out ; 22,000 birds were tested in the Salisbury area alone.

Fluke disease is on the increase in the colony. Of 140,263 cattle slaughtered under Meat Inspection Control, over 42,000 livers were wholly condemned.

A section of the report written by Mr. D. A. Lawrence, Assistant Director of Veterinary Services (Research), deals with the work of the laboratory. The diagnostic service of the laboratory has proved of great help to stock owners. In all, over 15,000 slides were examined ; also 2,594 blood samples were tested for contagious abortion, and, as already recorded, 22,000 birds tested for B.W.D.

The preparation of vaccines and remedies for the prevention and cure of disease is another important and essential service of the laboratory. During the year 234,000 doses of quarter-evil vaccine, 3,840 doses of horse sickness vaccine and about 4,000 doses of redwater and gall sickness vaccine were made and issued.

The results following the use of redwater and gall sickness vaccine were generally good but some difficulty was experienced in controlling the redwater reaction set up by the vaccine. Phenamidine has been used to replace trypanblue and although a successful drug, its effects are too slow. The new and more refined preparation of trypanblue has proved less effective than the old preparation for dealing with the redwater reaction. Gonacrine has recently been tried to control the redwater reaction and the few cases so far dealt with have responded very satisfactorily.

Acriflavine has been tried in natural cases of gall sickness and the results have been most encouraging ; 4 c.c. of a 5 per cent. solution of the drug is injected intramuscularly every day. Unfortunately, the use of the drug intramuscularly frequently has given rise to deep-seated abscess formation. From some experiments carried out there now seem to be grounds for hope that the drug can be given intravenously, thus avoiding the unfortunate sequelae of the intramuscular route. Coccidiosis among poultry still accounts for considerable losses in spite of the widespread use of sulphamezathine. Internal parasites are another cause of loss among domestic fowls, and control by the regular use of phenothiazine is being tried.

The Director of Veterinary Services (Mr. J. S. Adamson) and his staff are tackling the many disease problems of stock with commendable vigour and effect, and the department is playing an essential and important part in the present period of rapid growth and development of the stock industry and the colony generally.

W. W. H.

The *Australian News Letter* (issued by the Australian Information Bureau) states that an outbreak of disease is killing horses over a vast area of Western Queensland and the Northern Territory. "Valuable stock horses as well as wild brumbies are dying. The Queensland Department of Agriculture says the disease is widespread from Cloncurry and Longreach to the South Australian border and into the Northern Territory. It is believed to be caused by the horses eating a tropical weed common in that country. Experts say there is no known cure yet."

* * * * *

The Ministry of Food is investigating the quality and packing of tinned food imported from the Continent, some of which has been found tainted. A system of centralised inspection has been set up in Germany as a result of a visit by a Ministry veterinary surgeon and steps are being taken to see that quality and packing of meat in other countries are improved.—*Daily Graphic.*

QUESTIONS AND ANSWERS

The submission of questions for inclusion in this column will be welcomed; they can relate to any aspect of veterinary work, but must be of a general nature—questions cannot be considered in which information is sought regarding diagnosis or treatment of specific cases, nor for which solely a private reply is desired. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Recurrent Post-parturition Disorder in the Cow*

Q. 405.—*I should be glad if you could suggest the explanation and treatment in the following case. A Jersey cow, 13 years, had her 11th calf (alive) on August 31st. Milk fever followed and responded to calcium treatment. She retained her cleansing and had some discharge which cleared up in three weeks' time. Then she went off her feed and apparently had acetonaemia. She was given 4 oz. Glucodin subcutaneously and treacle as an aperient, and improved, but in a few days she went completely off her food again. However, 2 oz. Glucodin subcutaneously put her right. The condition recurs every few days. There is no grunting or grinding of teeth—just dry nose, and the cow stands huddled up and off feed. She has had some drenches of salt and bicarbonate of soda, etc., but the Glucodin seems the only agent that suits her. Only once since the initial attack has acetone been apparent.*

A.—In this case the acetonaemia was probably a sequel to the milk fever and the retained cleansing. The response to the subcutaneous injection of Glucodin was satisfactory but the recurrence of the symptoms every few days indicated that the Glucodin was being eliminated rapidly. Under such circumstances it is as well to repeat the injections daily for a few days or even twice daily in some cases. Drenches of salt and bicarbonate of soda are recommended and it is essential that the bowels be kept active. The odour of acetone varies and in some cases it is so slight that it is hardly noticeable. An abstract from "New Methods of Treating Ketosis" is to be found on page 825 of *The Veterinary Record* of December 8th, 1951.

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Poultry Case for Diagnosis*

Q. 406.—*A six-months-old pullet showed the following symptoms, of which I should appreciate an explanation. The bird was gripping its perch exceptionally tightly; the neck was limp and the head hung vertically, dragging the ground when the bird was placed on the floor. The tail drooped slightly, but wing carriage was normal. This bird recovered in 24 hours; another, similarly affected in a batch of 50, was killed by the owner.*

A.—The respondent has not met a case identical with that recorded by the questioner.

The symptoms described could be indicative of a number of conditions; they are not specific, however, for any of the recognised diseases of fowls. Botulism (or limberneck) in fowls is associated generally with symptoms of paralysis and when the neck muscles are involved the head hangs in a limp manner. In typical cases of botulism there is paralysis of legs and wings. Mild cases of this disease are recognised, the affected birds recovering in two or three days.

Cerebral haemorrhage in fowls does occur and when severe, death results very rapidly. It is possible that small haemorrhages in the brain may cause a temporary paralysis or nervous disorder.

Cases of cerebral thrombosis in the fowl can cause a permanent dragging of the neck on the ground.

Occasionally birds in laying batteries show varying symptoms of nervous derangement ascribed to photosensitisation. The affected birds recover when placed in a darkened room.

Finally, it must be mentioned that nervous symptoms are often present in the chronic or low form of Newcastle disease. Clonic spasms of leg, neck or whole body, torticollis and muscular inco-ordination are characteristic of this form of the disease. However, birds with this type of nervous derangement seldom recover since the damage to the nervous system appears to be permanent (Biester, H. E., & Schwarte, L. H. (1948), *Diseases of Poultry, second edition*).

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Chemical Caponisation of Cockerels

Q. 407.—*It has been observed that about seven days after chemical caponisation of cockerels, it is possible to distinguish between birds that have "taken" and birds that have "missed." Caponised birds frequently show soiling of the vent feathers, but particularly the legs are found to be distinctly warm, whereas, in non-caponised birds, the legs are cold. This has been observed in birds fattened indoors, under the intensive system. I should be interested to know if this is observed also in birds on free range.*

A.—As early as three to four days after caponisation, those birds which have "taken" will show a definite swelling and increased moisture of the vent, the swelling being particularly obvious on the upper lip. This swelling, which is similar to that seen in the laying hen, is what one would expect, since chemical caponisation brings about many changes in the implanted male similar to these seen in the laying hen. The appearance of the comb is a much slower guide to successful implantation, definite changes taking about 14 to 21 days to appear and varying in relation to initial appearance and colour of the comb.

The swelling of the vent, also called the "vent peep," is much the most reliable, and the earliest, sign of successful implantation.

In the experience of the writer, which is considerable, no difference has been observed in the temperature of the legs between caponised birds and cockerels; certainly no such difference has been observed between birds kept outdoors and intensively indoors.

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While accepting these questions for publication and response in this issue, we would draw the attention of our readers, for their future guidance, to the requirement now indicated at the head of this section, that questions must be of a general nature and not enquiring as to the diagnosis and treatment of specific cases.

Correspondence

Determination of "Calved"

Sir,—While it may in some cases be difficult to determine clinically whether or not a "heifer" has calved, I believe that it is possible to be quite definite on this point in the slaughterhouse. The criteria are the old corpus luteum of pregnancy (C. albicans) and the peritoneal surfaces of the uterine cornua.

The C. albicans can be differentiated from old cyclical corpora lutea by its lack of pigment and by its conspicuous content of white connective tissue.

The peritoneal surfaces of the uterine cornua of a "heifer" which has borne a calf show longitudinal grooves which result from shrinkage of the uterus during involution following its hypertrophy for the previous pregnancy.—Yours faithfully, G. H. Arthur, Field Station, Streatley House, Streatley, Berks. *December 21st*, 1951.

National Farmers' Union.—On Thursday of last week the Council of the National Farmers' Union unanimously re-elected Sir James Turner as President for the seventh successive year. Mr. H. Cole Tinsley, of West Deeping Manor, Peterborough, was elected Deputy President, and Mr. R. J. Charlton, a Lincolnshire farmer, became Vice-President.

NOTES AND NEWS

Diary of Events

Feb. 6th.—Special Meeting of the North Wales Division, B.V.A., at Ruthin (Council Chamber), 2 p.m.

Feb. 7th.—Meeting of the Central Veterinary Society at the Royal Veterinary College, N.W.1, 6 p.m.

Feb. 8th.—Royal Dick School of Veterinary Studies Annual Ball, in the Assembly Rooms, George Street, Edinburgh.

Feb. 13th.—Meeting of the Executive Sub-committee of the Editorial Committee, B.V.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Feb. 14th.—Glasgow University Veterinary Medical Association Annual Ball, at The Rhul, Sauchiehall Street.

Feb. 15th.—Meeting of the Society for the Study of Animal Breeding, at the Wellcome Research Institution, 183-193, Euston Road, London, N.W.1, 2.30 p.m.

Feb. 15th.—Meeting of the Lincolnshire and District Division, B.V.A., at Peterborough (Grand Hotel), 2.15 p.m.

Feb. 18th.—Lecture by Professor Marc Klein (Strasbourg) at Reading University, 5.30 p.m. (See Notice.)

Feb. 21st.—Meeting of the Herts and Beds Division, B.V.A., at St. Albans (70, Holywell Hill), 2.30 p.m.

Feb. 22nd.—Liverpool University Veterinary Society's Annual Ball, in the Students' Union, Bedford Street, 8 p.m.

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PERSONAL

Mr. J. N. Ritchie to Succeed Sir Thomas Dalling as Chief Veterinary Officer

As we go to press with this issue it is announced by the Ministry of Agriculture that Sir Thomas Dalling, Chief Veterinary Officer, will be succeeded from March 31st by Mr. J. N. Ritchie, Deputy Chief Veterinary Officer, stationed at Edinburgh. Mr. D. S. Barbour, Chief Superintending Veterinary Officer, will succeed Mr. Ritchie at Edinburgh. Further reference will be made at an early date.

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Cambridge University Lectureship.—The election is announced of Mr. Peter Sadler Bridge, B.Sc. (Edin.), M.R.C.V.S., D.V.S.M., as Lecturer in Animal Health in the department of Veterinary Clinical Studies, University of Cambridge. The appointment is for three years.

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Professor Forsyth's F.A.O. Assignment to Bengal

We learn with interest that Professor A. A. Forsyth, formerly Principal of the Glasgow Veterinary College, is now in Bengal at the instance of the Food and Agriculture Organisation of the United Nations. Professor Forsyth has been loaned by F.A.O. to the West Bengal Government, to assist them in the reorganisation and further development of the Bengal Veterinary College and their State Veterinary Services.

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Mr. and Mrs. Noel Ormrod Injured.—We regret to learn that Mr. Arthur Noel Ormrod, M.R.C.V.S., and Mrs. Ormrod, of "Ashleigh," Arrows Park Road, Woodchurch, Wirral, Cheshire, were seriously injured in a car and bus collision, involving seven people, in Parkgate Road, Chester, at noon on Sunday, January 20th. They met with their accident shortly after setting out to drive to Monte Carlo carrying the luggage of the Monte Carlo Rally entrants, Mr. Colin Edge, of Rock Ferry, and his co-driver, Mr. H. Bruce Murphie, of Birkenhead.

Mr. Ormrod, who was driving a car belonging to Mr. Murphie, sustained fractured ribs, dislocated hip, and head injuries, and is detained with his wife in Chester Royal Infirmary. Mrs. Ormrod has facial and head injuries. We understand that Mrs. Ormrod is making good progress, but that Mr. Ormrod's condition still gives cause for anxiety.

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Birth.—Rimmer.—On December 28th, 1951, at Crosby, Liverpool, to Beryl, wife of Bernard Rimmer, M.R.C.V.S., a daughter—sister to David, Ruth and Richard.

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Marriage.—Lakin—Earl.—On January 19th, 1952, at St. Mary's Church, Hendon, Middlesex, C. N. S. ("Tony") Lakin to Patricia Rae Earl, second daughter of Mr. and Mrs. L. W. Earl, of Hendon, Middlesex.

R.C.V.S. OBITUARY

Murray, Chalmers Bruce, B.Sc., Ph.D. (Lond.), M.R.C.V.S., only son of Mr. and Mrs. Chalmers Murray, of 1, Cornerways, Old Kenton Lane, N.W.9. Graduated London, July 4th, 1945; Lecturer in Histology at the Royal Veterinary College. Died January 23rd, 1952; aged 28 years.

Woollatt, Samuel B., F.R.C.V.S., Connington, Rosetta, Natal, South Africa. Graduated London, July 16th, 1897; Fellowship December 2nd, 1905. Died December, 1951.

Dr. Bruce Murray

An Appreciation

It is always tragic when someone dies early in his career; the more so when that career has already shown promise of being a brilliant one. But with the news of the death of C. B. Murray there will be an added shock to those who knew him at College as an athletic student, well above the average in physique.

Bruce Murray, qualifying in 1945 and with the B.Sc., returned at once to the Royal Veterinary College to serve in the Histology Department, and a year or so later had taken his Ph.D. It was after doing so that he contracted the illness that was to affect him until the end. I knew him very well and I never heard him complain throughout the long period in hospital or the longer period of convalescence. He maintained that it was less disastrous to him than it would be to a man who was in general practice. That was probably true; but to one as active as he was, with his love of sport, especially swimming, it must have been hard to bear. And to one who had shown himself capable of sustained hard work the injunction to take things easy for months after he left hospital must have been equally irksome. He made light of it all and was unperturbed at the prospect of almost weekly visits to hospital for two years or more.

I had hoped to see him again before Christmas, but he asked to postpone his visit as he was not feeling too fit. Shortly afterwards he told me that he had to go into hospital again for what was regarded as a relatively minor operation. Something went wrong and, on January 23rd, Bruce Murray died.

He was unmarried, living with his parents, and those of us who knew him well will have tremendous sympathy for Mr. and Mrs. Murray, knowing just how great has been their loss. P. J. D.

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Mr. S. B. Woollatt, F.R.C.V.S.

We learn with much regret from *The Natal Mercury* of January 1st, that Mr. S. B. Woollatt, F.R.C.V.S., died suddenly during the previous week after a serious illness of several months.

A contributor to the *Mercury* says of him: "'S.B.,' as he was affectionately known all over Natal, was one of the oldest residents of the Rosetta district and had bought his home, Connington, where he died, in the spring of 1914 from the successor of the late Mr. Cotton Acutt.

"A brilliant veterinary diagnostician, Mr. Woollatt was a close friend and associate of the late Sir Arnold Theiler and was Principal Veterinary Officer in Natal—the youngest in the Colony's history (he was 25 years old at his appointment)—until he resigned at the age of 32 and took up farming.

"His herd of Dairy Shorthorns is well known throughout South Africa and was famous in the show ring. He interested himself also in judging, being a senior judge (Shorthorns), and in agricultural organisations. He was Past-President of the Natal Agricultural Union and one of its most senior members.

"Mr. Woollatt was a great Rugby player and played for the Royal Veterinary College in London, where he became a Fellow of the Royal College of Veterinary Surgeons. He rowed for his school in England (Bedford) and out here played a lot of polo. During the South African War he was stationed chiefly at Estcourt. He saw service as well in the first World War.

"He was born at Astonbury, Ware, Hertfordshire, in 1874, and leaves a widow, four children—Jack Woollatt, May (Mrs. Jock Flower), Barbara (Mrs. Gordon McKenzie), Elizabeth (Mrs. Paul Klarer)—nine grandchildren and three sons-in-law."

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The Late Harry Steele-Bodger, M.R.C.V.S.

A Tribute From Denmark

Dr. Nicolai T. M. Plum, Past-President of the Danish Veterinary Association, who is an Honorary Member of the British Veterinary Association and a welcome and familiar figure at our Congresses, writes: "From the time that Harry Steele-Bodger studied infertility with Professor Folmer Nielsen in Copenhagen he was held in great esteem by his Danish colleagues. We learned to know him as a highly intelligent person who lived only for his home and for his profession, always anxious to get the work of his colleagues and his profession fully recognised and to serve the interests of his science.

"We l knowing his reputation among Danish colleagues who had met him in our country, it was a glorious adventure to see him in his own country many years later. The same virile and fascinating person, always in action with one thing or another—but though he was always very busy he had time enough to ask if he could help one in any way, and if one wanted help he was always ready. Many Danish veterinarians who have visited Great Britain in the years after the war owe him much gratitude for all that he has done for them to help them.

"I myself and many other Danish veterinarians feel that by his much too early death we have lost a good and helpful friend and the Eng ish veterinary profession a prominent member of whom British veterinarians should be proud.

"All of us, and especially those who have had the great pleasure to stay in his home, send our sympathy to his charming wife and their two sons."

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GENERAL OBITUARY

Professor Anton Brandt

It is with an especially deep feeling of regret that we learn, from the *Nordisk Veterinärmedicin* for December, 1951, of the death of Pro'essor A. J. Brandt, Rector of the Veterinary College of Norway, at Oslo. Anton Brandt will be remembered by many as the contributor of a moving little speech of grateful acknow'edgment of the pleasure afforded him by attendance at our Edinburgh Congress in 1947. Here is part of what he said: "The Norwegians had ever been inclined to turn their eyes to the west, and especially after the 'ast war they felt themselves linked to Great Britain with very strong bonds. Every day and every night their gaze was directed to their ally in the west in eager anticipation; every day and every night they listened to the news from the B.B.C.; every day and every night their thoughts and wishes went out to Great Britain who they knew in the end would free Norway from tyranny. The Norwegians learned to regard the people of Great Britain as their brothers and sisters: 'Your battle was our battle, your defeats also ours, your victories were our victories and your hurts our hurts. Never has Norway been so closely bound to Great Britain as to-day and this Congress will help to make still stronger the ties which unite us.' Norway would never cease to look towards the west for freedom and justice." That is a tribute which retains considerable significance to-day.

The *Nordisk Veterinärmedicin* records that Dr. Brandt died on November 14th, 1951, at the age of 58. He received his veterinary education at Copenhagen and qualified as a veterinary surgeon in 1919. He was a District Veterinarian for two years from 1922 to 1924. In 1924 he became a Veterinary Officer and in 1927 a Departmental Chief in the Veterinary Institute. He became Professor of General Patho'ogy in 1941 and from 1948 to 1951 he was Rector of the Veterinary College of Norway.

Information is given on the posts held by Professor Brandt in veterinary and other societies. He was Editor of *Norsk Veterinärtidskrift* from 1941 to 1948 and became a Senior Norwegian Editor of *Nordisk Veterinärmedicin* when the latter journal took over and incorporated the former.

Professor Brandt was an honorary member of the Norwegian Veterinary Society, the Swedish Veterinary Association, the Finnish Veterinary Association and the Danish Veterinary Society. He was a knight of the Danebrog order (Ridder av Den Dansk Danebrogsorden).

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LEGAL NOTES

Unlawful Practise of Veterinary Surgery

At Stockport Magistrates' Court on January 7th, William Heery, Manvers Street, Heaton Norris, Stockport, was fined a total of 40s. for practising veterinary surgery on two dates last October when not registered. He pleaded not guilty. Mr. J. A. L. Humphreys pro ecuted for the Royal College of Veterinary Surgeons.

Harry Ashton, foreman, Kendall Street, Stockport, said that on October 11th he took a 10-weeks-old Alsatian bitch which had a fit to Heery, who said the puppy had distemper coming on and told him to give it warm milk and whisky. On October 14th he again took the puppy to Heery, who gave him some powders for which he paid him 1s. "He advised me to see a veterinary surgeon if there was no improvement," added Mr. Ashton.

Mr. S. H. Thompson, Registered Veterinary Practitioner, of Wellington Road South, Stockport, said he saw the puppy on October 16th and gave it treatment.

Mr. Gordon Hand (Barlow, Parkin & Co.), for Heery, submitted that he had not "practised" veterinary surgery in the strict sense of the term. No order was made for costs.

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Dog "Chained in One Spot for Three Years."—At Dartford, recently, Frederick Groombridge and his wife, of Main Road, Sutton-at-Hone Kent, were each fined £5 and banned for life from keeping a dog for causing unnecessary suffering to a dog by not giving it proper care and attention and sufficient nourishing food. Inspector R. Stevens, of the R.S.P.C.A., said that the dog, a mongrel, was emaciated and its ribs cou'd be seen clearly. Its thigh muscles were withered and the action of the hind legs had gone, so that instead of walking the dog hopped. For three years it had been chained in one spot. It was found necessary to destroy the animal.

At the same Court, Violet Jeeves, 20, of East Road, Belvedere, was sent to prison for a month and banned for life from keeping a dog. She had been charged with causing unnecessary suffering to an Alsatian dog by not giving it care and attention when it was in a suffering state. After R.S.P.C.A. and police evidence—again of emaciation, etc.—had been given, Mr. Richard Hyam, veterinary surgeon, said that it was the worst case of cruelty and neglect he had come across. He decided to destroy the dog on humane grounds, but before he could do so it had a fit. It was then destroyed.

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MILK (SPECIAL DESIGNATIONS) ACT, 1949

Further Areas Specified for Regulation of Milk Sales

The Ministry of Food announces its intention to designate six additional districts as areas in which milk sold by retail must be sterilised, pasteurised, tuberculin tested or, until September 30th, 1954, accredited from a single herd. It is proposed to lay before Parliament draft orders to come into operation not earlier than June 1st. The areas are:—

Bath and Bristol.—County boroughs of Bath and Bristol, urban districts of Keynsham, Kingswood, and Mangotsfield, and rural districts of Bathavon and Warmley.

Birmingham and the Black Country.—County boroughs of Birmingham, Dudley, Smethwick, Walsall, West Bromwich, and Wolverhampton, boroughs of Bilston, Halesowen, Oldbury, Rowley Regis, Stourbridge, Sutton Coldfield, Tipton, and Wednesbury, and urban districts of Aldridge, Amblecote, Brierley Hill, Coseley, Darlaston, Sedgley, Solihull, Wednesfield, and Willenhall.

Bournemouth and District.—County borough of Bournemouth, boroughs of Christchurch, Lymington, and Poole, and urban district of Wimborne.

Ebbw Vale and District.—Urban districts of Abercarn, Abertillery, Bedwas and Machen, Bedwellty, Blaenavon, Brynmawr, Ebbw Vale, Mynyddislwyn, Nantyglo and Blaina, Pontypool, Rhymney, Risca, and Tredegar.

Liverpool and District.—County boroughs of Liverpool and Bootle, borough of Crosby, and urban districts of Litherland, Huyton-with-Roby, and Prescot.

Nottingham and District.—County borough of Nottingham, boroughs of Ilkeston and Mansfield, urban districts of Arnold, Beeston and Stapleford, Carlton, Eastwood, Hucknall, Kirkby-in-Ashfield, Long Eaton, Mansfield Woodhouse, Sutton-in-Ashfield, Warsop, and West Bridgford, part of the rural district of Basford that includes the parishes of Annesley, Awsworth, Bestwood Park, Brinsley, Burton Joyce, Calverton, Cossall, Felley, Greasley, Kimberley, Lambley, Linby, Newstead, Nuthall, Papplewick, Selston, Stoke Bardolph, Strelley, Trowell, and Woodborough, and part of the rural district of Shardlow that includes the parishes of Sandiacre and Stanton-by-Dale.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Anglesey.—Fadog Farm, Bodedern, Holyhead (Jan. 21st).

Angus.—Milton of Conon, Carmyllie, Arbroath (Jan. 21st).

Berks.—Little Farm, Barkham Road, Wokingham (Jan. 24th).

Cheshire.—Coo'oo Farm, Newton, Tattenhall (Jan. 22nd).

Worcs.—Wick Grange, Pershore (Jan. 21st).

Yorks (*N.R.*).—Clott House Farm, Ellenthorpe, Boroughbridge (Jan. 23rd).

Yorks (*W.R.*).—Townend Farm, Havercroft, Ryhill, Wakefield (Jan. 23rd); Farm near Sunnybank, Bentham (Jan. 24th).

Foot-and-Mouth Disease:

Yorks (*E.R.*).—Tansterne Farm, Aldbrough, Hull (Jan. 22nd).

Fowl Pest:

Lancs.—Fox Lane Ends Cottage, Westby, Kirkham, Preston (Jan. 22nd).

Suffolk (*W.*).—Sharp's Corner, Lakenheath, Brandon (Jan. 22nd).

Swine Fever:

Durham.—First Street Allotments, Horden (Jan. 21st).

Essex.—Silcock's Farm, Broadley Common, Nazeing (Jan. 21st).

Lancs.—Railway Al'otments, Station Road, Lytham St. Annes (Jan. 23rd); Astley's Farm, Schofield Lane, Atherton, Nr. Manchester (Jan. 25th).

Staffs.—33, Leighswood Road, Andridge, Walsall (Jan. 26th).

Sussex (*E.*).—Pie Farm, Racehill, Warren Road, Brighton (Jan. 23rd).

Warwicks.—Back of 116, Gracemore Crescent, Hall Green, Birmingham, 8; Hillside Farm, Grange Lane, Sutton Coldfield (Jan. 21st); Earlsbrook, Malthouse Lane, Earlswood, Birmingham (Jan. 24th).

Yorks (*W.R.*).—Piggeries at 17, Barleycote Road, Riddlesden, Keighley (Jan. 25th).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

CAUSES OF AGALACTIA IN THE SOW

Sir,—Mr. A. Hogg is to be congratulated on his contribution, in the issue of *The Veterinary Record* of January 19th, dealing with two conditions in pigs. I was interested chiefly in his classification of the causes of agalactia in the sow, for I am convinced that there is a real need for further study of porcine ailments. The N.V.M.A. publication on Pig Diseases is an excellent booklet, but it is by no means exhaustive. The increasing pig population in the country has revealed conditions not formerly recognised.

As Mr. Hogg points out, one has been told that milk fever is common in sows but in practice it is rarely seen. The writer suspects that other conditions, including post-parturient fever, have been loosely grouped under this heading in the past. A condition answering very closely to Mr. Hogg's description of post-parturient fever has been encountered frequently and is of major economic importance. In one herd, before treatment was commenced, of approximately 100 pigs born not one was saved. The hardening of the udder, commencing in the posterior glands and extending progressively forward, was a constant feature. Sulphamezathine, 33 per cent. solution in the recommended doses subcutaneously for two to three days, has been found to be effective in the treatment of the condition. It has been used most frequently in conjunction with penicillin but it is thought that the chief benefit has been derived from the former, for penicillin alone, as Mr. Hogg has found, is somewhat disappointing. In addition, pituitrin is usually given for the first two days. Provided that the piglets are hand fed for the first few days the majority can be saved, for the sow usually regains her milk and rears the litter.

An interesting feature is that when a sow is affected with the condition she frequently loses her maternal instinct and will lie on the piglets, taking not the slightest notice of their screams, and as a result many are killed in this way.—Yours faithfully, H. A. CRAWSHAW, 37, St. John's Road, Newbury. *January 21st*, 1952.

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SNAPE'S "ANATOMY OF AN HORSE"

Sir,—I was interested to read the article on Snape's "Anatomy of An Horse," by R. B. Maneely, published in *The Veterinary Record* of January 26th, 1952, especially as I am the proud possessor of a first edition presented to me by Professor G. H. Wooldridge.

On the relative quality and historical value of this book I am in complete agreement with Maneely, and I am glad also he has quoted the opinion of that eminent veterinary historian Frederick Smith. Snape's utter plagiarism of Ruini's plates, however, is undoubted, and in connection with the true history of the originals, Maneely's suggestion that Leonardo da Vinci's enquiries into the surface anatomy of the horse may have produced the type of drawing on which Ruini's plates were based is worthy of serious consideration. I can testify to the Snape family association with King's College, Cambridge. As a freshman in conversation with the Vice-Provost I told him I was not the first veterinary contact with the College, as a son of a veterinary surgeon was Provost in the early 18th century. Any doubts on this were satisfied when together we referred to the College Calendar.

May the pages of the *Record* more often be enriched by articles of this nature.—Yours faithfully, C. W. OTTAWAY, Department of Veterinary Anatomy, The University, Bristol, 8. *January 28th*, 1952.

Sir,—As a reader of *The Veterinary Record* especially interested in the history of the horse, may I thank Mr. R. B. Maneely for his most interesting contribution. What giants these "farriers" were! Some 40 years before this "Anatomy of an Horse," the Duke of Newcastle, author of one of the first English books on riding, was busy improving British stock by crossing with "Spanish Armada Horses."

The Earls of Aylesford—the first Earl created by King Charles—were great patrons of the "sport of Kings," and in the splendid park at Packington there is still to be seen a stone erected "to the memory of William Cawsey, Farrier, of London, who was killed on this spot on Thursday, September 3rd, 1789, being struck dead by lightning. To commemorate this awful event, as well as to warn others from exposing themselves to the same danger by taking shelter in thunderstorms under trees."

In 1717, published in English, was the "Compleat Horseman: discovering the surest marks of the Beauty, Goodness, Faults, and Imperfections of Horses," by the Sieur de Solleysel, Equerry to the French King, translated by Sir William Hope, who also wrote the supplement.

The first work of this kind, by a Member R.C.V.S., was "Modern Practical Farriery" (1865). It was illustrated by Benjamin Herring, making it a veritable treasure in the realms of sporting art.—Yours faithfully, IVOR HUGHES, Coleshill, Warwicks.

OEDEMA DISEASE OF SWINE

Sir,—The cause of oedema disease remains obscure. Might I therefore suggest what I have had in mind for some time now, and for what it is worth? Perusal of medical literature kindly loaned to me by a doctor friend brought to light a similarity of symptoms between beri-beri and what has become known as oedema disease in young pigs.

Vitamin B_1 deficiency in humans produces:—

1. Effects on the nervous system, with accompanying paralysis.
2. Effects on certain tissues, producing effusions.
3. Cardiac weakness.

In the pig with oedema disease these symptoms are in the same sequence.

Acute infantile beri-beri in humans has its effect on children aged mainly one to three months. It is often sudden in onset and accompanied by paroxysmal pain, and death may occur within hours. As perhaps with a litter of pigs, beri-beri, it seems, can be produced in breast-fed infants of beri-beri mothers. With these similarities and sequences of symptoms, can we entirely rule out B_1 deficiency as the cause of, or contributory to, the effects we observe in oedema disease?—Yours faithfully, R. J. A. SWIFT, 12, Severn Street, Welshpool. *January 27th*, 1952.

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PINS INSTEAD OF SUTURES

Sir,—The longer one plays around with stainless steel pins, etc., in relation to the repair of fractures in dogs, the more uses one finds for this type of equipment. About five weeks ago I was faced with the problem of repair of extensive damage to the under-surface of the jaw of a dog. The entire skin and subcutaneous tissue had been torn off the dog's lower jaw and submaxillary space from the incisors back to the commissures of both lips. At first glance it seemed like a large mass of red flesh lying over "Adam's apple." Further examination showed some periostitis. There were no other marks on the head or body. A reconstruction of the condition appeared to indicate that the animal had come in contact with the bumper of a fast-moving car. There was no flesh over the exposed entire ventral surface of the bones of the jaw.

Treatment.—Under deep nembutal anaesthesia the lips were sutured to the lateral canines, using silver wire; a quick look at the results at this juncture showed a large pouch under the jaw which readily would harbour all sorts of filth and would easily be filled up even before the dog came out of the anaesthetic. Suturing was "out" as there was no flesh on the mandibles, so I decided that stainless steel pins was the only possible answer. Consequently I drove a ¼ inch steel pin through the skin and into the jawbone between the last premolar and the first molar teeth. I had some idea of pushing one pin right through both mandibles, but, striking the root of a tooth, I had to be content with two pins in a lateral medial direction from either side. I was able to push them through the jaw to the depth of about 1 inch. I cut the pins about 2 inches from the lateral sides of the jaw on either side. This procedure seemed to take up the slack under the jaw. I instructed the owner to feed the dog on fluids, wash out the cavity with normal saline and 6,000 units penicillin suspension after each meal.

Some ten days later the owner returned the dog for a check up. I found the silver sutures on one side ruptured and that the skin on the same side had slipped over the pin. There was a large union between the skin and the bone but in such a position that if it had been left, quite a large area of the mandible would have remained exposed and unsightly. At this juncture the owner informed me that the silver suture cut through the lips before the animal came out of the anaesthetic. The other side was perfect. I therefore re-anaesthetised the animal, dissected the skin from the bone, pushed it over the pin and bent the pin upwards. The broken silver suture was replaced with coarse nylon.

Some three weeks later I saw the dog again; this time both pins had been knocked out and the remaining silver suture on the other canine was gone; however, they had been left in long enough to permit a perfect union. The nylon suture was still intact.

On reviewing the operation in retrospect I think a better line would be as follows:—

1. Use nylon instead of silver suture. Nylon sits around the teeth much better; it does not cut the lips, nor does it cause any irritation.

2. The free ends of the pins could be threaded to permit the carriage of a large nut. This nut could be screwed up on the pin until it is flush with the skin. This would reduce the dead space between the skin and the mandible, thus eliminating a large source of infection; furthermore, there would be no pins sticking out from the face to worry the patient or to come in contact with kennel appointments, etc.—Yours faithfully, W. HOGARTH SCOTT, 264, Lonsdale Sreet, Dandenong, Victoria, Australia. *December 21st*, 1951.